Voltage Monitoring Relays p9-1 Current Monitoring Relays p9-5 Phase Shift Monitoring Relays p9-8 Frequency Monitoring Relays p9-8 Earth Leakage Relays p9-18



0.0.0.0.0.0.0.0.0 . ON ON Led constantly 9 9 9 14 .0.4 RESET 000000000





Voltage monitoring relays

For three-phase systems, without neutral



P	M١	/1	0	A	4	4	٥



PMV20...



PMV30...



PMV40...

Order code	Rated voltage	Qty	Wt		
	to control Ue	per			
	(phase to phase)	pkg			
	[V] 50/60Hz	n°	[kg]		
Three-phase system, without neutral.					
Phase loss and incorrect phase sequence. Instantaneous trip					
PMV10 A440	208-480VAC	1	0.050		

PMV20 A240	100-240VAC	1	0.120
PMV20 A575	208-575VAC	1	0.120
PMV20 A600	380-600VAC	1	0.120

General characteristicz

- Voltage monitoring relay, self powered, for phase loss and incorrect phase sequece
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- _ 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing: 1-module for PMV10; 2-module for PMV20
- IEC protection degree: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

Certifications and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601) as Auxiliary Devices Compliant with standards: IEC/EN 60255-5 IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508,

CSA C22.2 nº 14. **Operational diagram**

See page 9-10.

General characteristics

- Voltage monitoring relay, self powered, for minimum voltage, phase loss and incorrect phase sequence
- Configurable rated voltage (Ue): PMV30 A240: 208-220-230-240VAC
 - PMV30 A575: 380-400-415-440-460-480-525-575VAC Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- _ 1 relay output with 1 changeover contact (SPDT)
- _
- Modular DIN 43880 housing, 2-module IEC protection degree: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTIVILIVIS	
"V min"	Minimum voltage tripping threshold
	80-95% Ue
"Delav"	Tripping time 0.1-20s

"Reset delay"	Resetting time 0.1-20s.	

Certifications and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508,

CSA C22.2 nº 14

Operational diagram

See page 9-10.

General characteristics

- Voltage monitoring relay, self powered, for asymmetry, phase loss and incorrect phase sequence
 - Excellent tripping accuracy
 - _ TRMS measurements (True Root Mean Square)
 - _ Control of phase-to-phase voltages _
 - Phase loss detection if one of the voltages is <70% rated value
 - Phase loss tripping time: 60ms
 - 1 relay output with 1 changeover contact (SPDT) Modular DIN 43880 housing, 2-module _ _
 - _ IEC protection degree: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

- High voltage asymmetry tripping threshold 5-15% Ue Tripping time 0.1-20s "Asymmetry" "Delay"
- "Reset delay" Resetting time 0.1-20s

Certifications and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices. Compliant with standards: IEC/EN 60255-5 IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-10.



Melbourne (03) 9706 4599

Adelaide (08) 8347 2499

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Phase loss and inc	Phase loss and incorrect phase sequence. Instantaneous trip				
PMV40 A240	208-240VAC	1	0.130		
PMV40 A575	380-575VAC	1	0.130		
PMV40 A600	600VAC	1	0.130		
-					

Three-phase system, without neutral.

Phase loss and incorrect phase sequence. Instantaneous trip.					
PMV40 A240	208-240VAC	1	0.130		
PMV40 A575	380-575VAC	1	0.130		
PMV40 A600	600VAC	1	0.130		



Order code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
T I I I			

Three-phase system, without neutral. Minimum AC voltage. Delayed trip.

Phase loss and incorrect phase sequence. Instantaneous trip.

	wato 🖛		
PMV 3			0X
	UN (SARE)	genal to	
100	170 170 127	an and dela	28 28

Voltage monitoring relays

For three-phase systems, without neutral

	V max (%0e) Delay (A)
	V min (%Del) Delay (s)
1	130 Ue (VAC) 127 0.1 Reset Gelay (s)

PMV50...

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[ka]

Three-phase system, without neutral

Order code

Delayed trip.

PMV70 A240

PMV70 A575

PMV70 A600

Minimum and maximum AC voltage. Delayed trip.

Rated voltage

to control Ue

[V] 50/60Hz

Minimum and maximum AC voltage and asymmetry.

208...240VAC

380...575VAC

600VAC

Phase loss and incorrect phase sequence. Instantaneous trip.

Three-phase system, without neutral.

(phase to phase)

Phase loss and incorrect phase sequence. Instantaneous I			
PMV50 A240	208240VAC	1	0.130
PMV50 A575	380575VAC	1	0.130
PMV50 A600	600VAC	1	0.130



General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss and incorrect phase sequence
- Configurable rated voltage (Ue):
- PMV50 A240: 208-220-230-240VAC • PMV50 A575: 380-400-415-440-460-480-525-575VAC - High tripping accuracy
- TRMS measurements (True Root Mean Square) _
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 module IEC degree of protection: IP40 on front (only when
- placed in IP40 enclosure or control board); IP20 on terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold
	105115% Ue
"V min"	Minimum voltage tripping threshold
	8095% Ue
"Delay" for each	Tripping time 0.120s
((D) +	Description from 0.4 000

"Reset delay" Resetting time 0.1...20s.

Certifications and compliance

Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices. Compliant to standards: IEC/EN 60255-5 IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14

Operational diagram

See page 9-10.

General characteristics

Wt

[kg]

0.130

0.130

0.130

Qty

per

pkg

n°

1

1

1

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, incorrect phase sequence and asymmetry
- Configurado ado adorna de la contegurada de la configurada de la config
- Excellent tripping accuracy TRMS measurements (True Root Mean Square)
- _
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 module
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at . terminals
- ADJUSTMENTS

"V max"	Maximum voltage tripping threshold
	105115% Ue
"V min"	Minimum voltage tripping threshold

V IIIIII	winning voltage unpping unconoic
	8095% Ue
"Delay" for each	Tripping delay 0.120s

"Asymmetry" High voltage asymmetry tripping threshold 5...15% Ue.

Certifications and compliance

Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-10.



PMV70...





Voltage monitoring relays

For three-phase systems with or without neutral



9	-	-	-

PMV50N...

er code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Three-phase system, with or without neutral.

Orde

Order code

Delayed trip.

Instantaneous trip.

PMV70N A240

PMV70N A440

PMV70N A600

Minimum and maximum AC voltage. Delayed trip. Phase loss, neutral loss and incorrect phase sequence. Instantaneous trin

Rated voltage

to control Ue

[V] 50/60Hz

Minimum and maximum AC voltage and asymmetry

Phase loss, neutral loss and incorrect phase sequence.

208...240VAC

380...440VAC

480...600VAC

Three-phase system, with or without neutral.

(phase to phase)

Qty

per

pkg

n°

1

Wt

[kg]

0.200

0.200

0.200

motantanoodo trip	•		
PMV50N A240	208240VAC	1	0.200
PMV50N A440	380440VAC	1	0.200
PMV50N A600	480600VAC	1	0.200

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, neutral loss and incorrect phase sequence
- PMV50N A240: 208-220-230-240VAC (phase-phase) 120-127-132-138VAC (phase-neutral)
 PMV50N A440: 380-400-415-440VAC (phase-neutral)
 PMV50N A440: 380-240-254VAC (phase-neutral)
 PMV50N A600: 480-526-526 600VAC (phase-neutral)
- PMV50N A600: 480-525-575-600VAC (phase-phase) 277-303-332-347VAC (phase-neutral)
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square) _
- Phase loss detection when one of the voltages is <70% rated voltage
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 module
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals

ADJUSTMENTS

- "V max" Maximum voltage tripping threshold 105...115% Ue
- "V min" Minimum voltage tripping threshold 80...95% Ue
- "Delay" for each Tripping time 0.1...20s "Reset Delay" Resetting time 0.1...20s.

Certifications and compliance

Certifications obtained: EAC. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

Operational diagram

See page 9-11.

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, neutral loss,

- and maximum voltage, phase loss, learnal loss, incorrect phase sequence and asymmetry
 4 configurable rated voltage (Ue):
 PMV70N A240: 208-220-230-240VAC (phase-phase) 120-127-132-138VAC (phase-neutral)
 PMV70N A440: 380-400-415-440VAC (phase-neutral) 220-230-240-254VAC (phase-neutral)
 PMV70N A600: 480-525-575-600VAC (phase-neutral) 277-303-332-347VAC (phase-neutral)
- 277-303-332-347VAC (phase-neutral)
- Excellent tripping accuracy TRMS measurements (True Root Mean Square)
- Phase loss detection when one of the voltages is
- <70% rated value
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 module
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at . terminals

max"	Maximum voltage tripping threshold
	105115% Ue

Minimum voltage tripping threshold 80...95% Ue

High voltage asymmetry tripping "Asymmetry"

threshold 5...15% Ue. **Certifications and compliance**

Certifications obtained: EAC.

Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-11.



PMV70N...

Melbourne (03) 9706 4599 Sydney (02) 9676 1671

Brisbane (07) 3274 3327

ADJUSTMENTS "\

- "V min"
- "Delay" for each Tripping time 0.1...20s

Voltage monitoring relays

For three-phase systems, with or without neutral



PMV80N...

Wt Order code Rated voltage Qty to control Ue per (phase to phase) pkg [V] 50/60Hz n° [kg]

Three-phase system, with or without neutral.

Minimum and maximum AC voltage, minimum and maximum

frequency. Delayed trip.

Phase loss, neutral loss and incorrect phase sequence. Instantaneous trip

PMV80N A240	208240VAC	1	0.200
PMV80N A440	380440VAC	1	0.200
PMV80N A600	480600VAC	1	0.200



General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, minimum and maximum frequency, phase loss, neutral loss and incorrect phase sequence
- 4 configurable rated voltage (Ue):
- PMV80N A240: 208-220-230-240VAC (phase-phase) 120-127-132-138VAC (phase-neutral)
- PMV80N A440: 380-400-415-440VAC (phase-phase)
- 220-230-240-254VAC (phase-neutral) PMV80N A600: 480-525-575-600VAC (phase-phase)
- 277-303-332-347VAC (phase-neutral) Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection if one of the voltages is <70%
- rated value
- Phase or neutral loss tripping time: 60ms 2 relay outputs, each with 1 changeover contact (SPDT) Modular DIN 43880, 3 module
- IEC degree of protection: IP40 on front (only when placed in iP40 enclosure or control board); IP20 at terminals

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold
"V min"	105115% Ue Minimum voltage thripping threshold
V IIIIII	8095% Ue
"Hz min/max"	Minimum/maximum frequency tripping
	threshold 110%
"V delay"	Tripping time 0.120s
"Hz delay"	Tripping time 0.15s.
Ooutifications a	and somellows

Certifications and compliance

Certifications obtained: EAC. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-11.

For single-phase systems



PMV55...

Order code	Rated voltage to control Ue	Qty per pkg	Wt	
	[V] 50/60Hz	n°	[kg]	
Single-phase system.				

Minimum and maximum AC voltage. Delayed trip.			
PMV55 A240	208240VAC	1	0.125
PMV55 A440	380440VAC	1	0.125

General characteristics Voltage monitoring relay, self powered, for minimum

- and maximum voltage
- 4 configurable rated voltage (Ue): PMV55 A240: 208-220-230-240VAC PMV55 A440: 380-400-415-440VAC
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 module IEC degree of protection: IP40 on front (only when
- _ placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold
	105115% Ue
"V min"	Minimum voltage tripping threshold
	8095% Ue
"Delay" for each	Tripping time 0.120s

"Reset delay" Resetting time 0.1...20s.

Certifications and compliance

Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices. Compliant with standards: IEC/EN 60255-5 IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-11.





Current monitoring relays

For single-phase systems

3 3 3 3 PMA20 240

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]

Single-phase system. AC/DC maximum current control. Auxiliary AC/DC power supply.

Automatic or manual reset.					
PMA20 240	5 or 16A	24240V AC/DC	1		

General characteristics

- Current monitoring relay for AC/DC maximum current control, AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max or by current
- transformer (CT)
- _
- _
- _
- Excellent tripping accuracy TRMS current measurements (True Root Mean Square) Resetting and inhibition input 1 relay output with 1 changeover contact (SPDT) Modular DIN 43880 housing, 2 module IEC degree of protection: IP40 on front (only when black din ID40 and house or control hourd), ID20 of _ placed in IP40 enclosure or control board); IP20 at terminals

ADJUSTMENTS

0.121

IIIIdX	Maximum current unpping unesholu
	5100% le
Hysteresis"	Maximum hysteresis threshold
	150%
Trip delay"	Tripping time 0.130s
Inhibition time"	Inhibition delay for external input or a
	power up 160s
Aut. reset delay"	Automatic resetting time 0.130s
Mode"	Rated current 5A or 16A

- · Relay output normally energised or
 - de-energised
 - Tripping memory (Latch) On or Off.

a ourrept tripping throughold

Certifications and compliance Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices -Modular ampere monitoring relays. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-12.





Adelaide (08) 8347 2499

Current monitoring relays

For single and three-phase systems



PMA30 240

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]

Single-phase system.

AC/DC minimum or maximum current control. Delayed trip Auxiliary AC/DC power supply. Automatic or manual reset.

PMA30 240	5 or 16A	24-240V AC/DC	1	0.121

Mechtric

General characteristics

- Current monitoring relay for AC/DC minimum or maximum current control; AC/DC multivoltage
- auxiliary power supply Direct connection up to 16A max, or by current transformer (CT)

Excellent tripping accuracy TRMS current measurements (True Root Mean Square)

- _
- _
- Resetting and inhibition input 1 relay output with 1 changeover contact (SPDT) Modular DIN 43880 housing, 2-module IEC protection degree: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJ	UST	ME	NTS

Set point"	Minimum or maximum current tripping threshold 5-100% le
Hysteresis"	Minimum or maximum hysteresis
-	
Irip delay"	Tripping time 0.1-30s
Inhibition time"	Tripping delay for external input or at
	power up 1-60s
'le"	Current scale selection: 5A or 16A
Mode"	Min or max function
	Relay output normally energised or de-energised
	• Tripping memory (Latch) On or Off.

Certifications and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices - Modular ampere monitoring relays.

Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See pages 9-13 and 9-14.

General characteristics

- Current monioring relay for AC/DC minimum and maximum current control, AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max, or by current transformer (CT)
- Excellent tripping accuracy TRMS current measurements (True Root Mean Square) Automatic or manual resetting (manual resetting by _
- power removal) 2 relay outputs (Min and Max), configurable, each with
- _
- I changeover contact (SPDT) Modular DIN 43880 housing, 3-module IEC protection degree: IP40 on front (only when placed in iP40 enclosure or control board); IP20 at terminals. ADJUSTMENTS

nax"	Maximum current tripping threshold
	5-100% le

	J-100% IE
"Imin"	Minimum current tripping threshold
	5-100% le
"Trip delay"	Minimum and maximum current
	tripping time 0.1-30s
"Inhibition time"	Tripping time at power up 1-60s
"le"	Current scale selection: 20mA, 50mA,
	250mA, 1A, 5A or 16A
"Mode"	Separate or common relay outputs
	Relay output normally energised or
	de-energised
	• Tripping momony (Latch) On or Off

Tripping memory (Latch) On or Off.

Certifications and compliance

Certifications obtainee: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices - Modular ampere monitoring relays. Compliant with standards IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram See page 9-15.



PMA40 240

Order code	Rated	Auxiliary	Qty	Wt	
	current	supply	per		
	le	voltage	pkg		
	[A]	[V]	n°	[kg]	

Single-phase system.

AC/DC minimum and maximum current control. Delayed trip. Auxiliary AC/DC power supply.

Automatic or manual rese

PMA40 240	0.02-0.05- 0.25-1-5- 16A	24-240V AC/DC	1	0.166



PAGE 9-6



Pump protection relay

For single and three-phase systems

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]

Single and three-phase systems.

.........

3 3 3 3 3 3

PMA50...

Maximum AC current and minimum $\cos\varphi$. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip. Auxiliary AC power supply.

Automatic of manual reset.				
PMA50 A240	5 or 16A	220-240VAC	1	0.251
PMA50 A415		380-415VAC	1	0.251
PMA50 A480		440-480VAC	1	0.251

General characteristics

- Pump protection relay against dry running, auxiliary AC power supply Motor under-load and over-current control Direct connection up to 16A max, or by current
- _ transformer (CT) Excellent tripping accuracy Voltage control range 80-660VAC
- _
- _
- _
- _ _
- _
- Current control range 0.1-16A Resetting and enabling consent input 1 relay output relay with 1 changeover contact (SPDT) Modular DIN 43880 housing, 3-module IEC protection degree: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals. ADJUSTMENTS

Minimum $\cos \varphi$ threshold 0.1-0.99
(under-load/dry running)
Maximum (over) current threshold
10-100%le
Tripping time for minimum $\cos\varphi$ and
maximum current 0.1-10s
Tripping delay for external input or at
power up 1-60s
Automatic reset time OFF-100min
 Rated current 5A or 16A
 Single or three phase
External reset On or Off.

Certifications and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices - Modular ampere monitoring relays. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-16.



Phase Shift and Frequency Monitoring relays

Phase shift monitoring relay for single and three-phase systems

04 05 05 07 00 00	,
Cose max 0.4 0.5	Trip Genay (s)
Coop min	0,1 30 Trip delay (s) 20 40
Node - G	inde the second

PMA60...

Order code Rated Auxiliary Qty Wt current supply per voltage le pkg [A] [V] n° [kg]

Single and three-phase systems.

Minimum and maximum cos q control. Delayed trip. AC auxiliary power supply.

Automatic of manu	ai iesel.			
PMA60 A240	16A	220-240VAC	1	0.254
PMA60 A415		380-415VAC	1	0.254
PMA60 A480		440-480VAC	1	0.254



General characteristics

- Minimum and maximum phase shift monitoring relay, AC auxiliary power supply
- Direct connection up to 16A max, or by current transformer (CT)
- Excellent tripping accuracy
- Voltage control range 80-660VAC
- _ Current control range 0.1-16A
- Automatic or manual resetting (manual resetting by
- power removal) 2 relay outputs (Min and Max), configurable, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3-module IEC protection degree: IP40 on front (only when placed in iP40 enclosure or control board); IP20 at terminals

ADJUSTMENTS

Minimum $\cos \varphi$ threshold
0.1-0.99 inductive
Tripping time for minimum $\cos \varphi$
0.1-30s
Maximum inductive cosφ threshold
0.1-0.99
Tripping time for maximum $\cos \varphi$
0.1-30s
Tripping delay at power up 1-60s
Single or three phase
· Relay outputs normally energised or
de-energised

• Tripping memory (Latch) On or Off.

Certificartions and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices - Modular ampere monitoring relays. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Operational diagram

See page 9-17.

General characteristics

- Frequency monitoring relay, self powered, for minimum and maximum control
- Rated frequency selection: 50 or 60Hz Tripping threshold for minimum and maximum
- Inppling this should be minimum and maximum and maxim
- placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTIVIENTS	
"Hz max"	Maximum frequency tripping threshold
	+1 to +10%
"Delay"	Tripping time 0.1-20s
"Hz min"	Minimum frequency tripping threshold
	-1 to -10%
"Delay"	Tripping time 0.1-20s
"Reset delay"	Resetting time 0.1-20s
"Mode"	Minimum and maximum frequency
	Output relay energised at maximum
	frequency
	Output relay energised at minimum
	frequency
	· Output relay de-energised at maximum

frequency.

Certifications and compliance

Certifications obtained: GOST; UL Listed, for USA and Canada (File E93601), as Auxiliary Devices. Compliant with standards: IEC/EN 60255-5 IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, BCSA C22.2 nº 14

Operational diagram

See page 9-18



Frequency monitoring relay	
for single and three-phase	
systems	

+5 10 ON
+2,5 +7,5 5 15
+1 +10 0,1 +10 20
-5 10 25 . 75 5 . 15
Hz min [%] Delay [s]
Mode Reset delay [s]

PMF20...

Order code Rated voltage Ue Wt Qty per pkg [V] 50/60Hz n° [kg] Single and three-phase systems.

Minimum and maximum frequency. Delayed trip.

Automatic reset

PMF20 A240	220-240VAC	1	0.125
PMF20 A415	380-415VAC	1	0.125





Operational Diagrams

Voltage monitoring relays for 3-phase systems without neutral



PMV10 - PMV20 - PMV30 PMV40 - PMV50 - PMV70

Phase loss and incorrect phase sequence (PMV10-PMV20-PMV30-PMV40-PMV50-PMV70)



Maximum and minimum voltage (PMV30 - PMV50 - PMV70)



Asymmetry (PMV40 - PMV70)





Operational Diagrams







PMV55







Operational Diagrams

Current monitoring relay for 1-phase systems PMA20



Single-phase direct connection



Three-phase connection with CT (1 phase control)



Three-phase direct connection (1 phase control)



Operation				
Position	le	Relay output	Latch	
A	5A	OFF	OFF	
В			ON	
С		ON	OFF	
D			ON	
E	16A	OFF	OFF	
F			ON	
G		ON	OFF	
H			ON	







Operational Diagrams



Current monitoring relay for single phase and three phase systems PMA30

Single-phase connection by CT



Single-phase direct connection



Three-phase connection by CT (1 phase control)



Three-phase direct connection (1 phase control)



Operation				
Position	Function	Relay output	Latch	
A	Minimum	OFF	OFF	
В	current		ON	
С		ON	OFF	
D	1		ON	
E	Maximum	OFF	OFF	
F	current		ON	
G	1	ON	OFF	
Н			ON	



Maximum current control operation with no tripping latch (Latch OFF) A1 A2 $\mathrm{ON}\,\otimes$ A1 Y Inhibition С Inhibition time t > trip delay Trip Max current \otimes t < trip delay t < trip delay Threshold Max current Hysteresis Max current Inhibition Inhibition Inhibition $A \xrightarrow{c} H \xrightarrow{c} H \xrightarrow{c} H$ Relay ON 11 $\frac{14}{12}$ $\int_{H}^{F} \frac{\text{Relay OFF}}{11} \frac{14}{12}$





Operational Diagrams







Operational Diagrams

N(-) -L(+) -

L1 L2 L3







	Operation			
Position	Operation	Relay output	Latch	
A	Separate	OFF	OFF	
В	relays		ON	
C		ON	OFF	
D			ON	
E	Common	OFF	OFF	
F	relays		ON	
G		ON	OFF	
H			ON	









Operational Diagrams

Pump protection motor under-load/over-current monitoring

PMA50







Single-phase connection by CT



Operation				
Position	le	Connection	External reset	
A	5A	1 phase	OFF	
В			ON	
С		3 phase	OFF	
D			ON	
E	16A	1 phase	OFF	
F			ON	
G		3 phase	OFF	
Н			ON	







PROTECTION RELAYS Operational Diagrams



Phase shift monitoring relay PMA60



Three-phase direct connection



Single-phase connection by CT

L1 N					-		L O A D
	18		Ŧ	L1/L	L2/N		
Γ.							
	1	6A ~	-	6	00V -	~	
	METER						
			MIN c	:0Sφ		MAX cosq	
	A1 A	2		12 11			1

Operation				
Position	Connection	Relay output	Latch	
A	1 phase	OFF	OFF	
В			ON	
С		ON	OFF	
D			ON	
E	3 phase	OFF	OFF	
F]		ON	
G		ON	OFF	
Н	1		ON	















Operational Diagrams

Frequency monitoring relay PMF20

MAX-MIN, MAX or MIN function





MAX function





Earth leakage relays

Relays with 1 operation threshold



R1D..



RM1...



31 RM..



31 RMT...



31 RC60...



31 RC110...

Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	۲	n°	[kg]
1 OPERATION THRESHOLD.				

Flush mount. External CT.

	0			
R1D 415	110-240-415V	1	1	0.280
R1D 48	24-48VAC/DC	1	1	0.280

110-125VAC (50/60Hz)/DC 220-240VAC (50/60Hz)

380-415VAC (50/60Hz)

Urder code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	5	n°	[kg]
1 OPERATION THRESHOLD. Modular, 35mm DIN (IEC/EN 60715) rail mounting. External CT. Fixed tripping set point and time.				
RM1 48	24-48VAC/DC	1	1	0.175

RM1 415 110-240-415V 1 1 0.175 AC 0

1 OPERATION THRESHOLD.

Modular, 35mm DIN (IEC/EN 60715) rail mounting External CT.

31 RM 48	24-48VAC/DC	1	1	0.190
31 RM 415	110-240-415V	1	1	0.190
	0			

1 OPERATION THRESHOLD.

Modular, 35 mm DIN (IEC/EN 60715) rail mounting. Ø 28 mm incorporated CT. Configurable fail safe

2 20 min moorporatou on oomgarabio ran oaror				
31 RMT 415	110-240-415V	2 🕑	1	0.375
	0			

Supply voltage: 110-125VAC (50/60Hz)/DC 220-240VAC (50/60Hz)

380-415VAC (50/60Hz).

2 output relays, each with 1 changeover contact.

General characteristics

- Earth leakage relay type A Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Flush mount 96x96mm housing with transparent cover
 - IEC degree of protection: IP20 terminals, IP40 on front with cover.

Mechtric

ADJUSTMENTS FOR R1D

- Configurable tripping 0.025-0.25A set-point $(I\Delta n)$:
 - 0.25-2.5A 2.5-25A
 - 25-250A (with external
 - multiplier RX10)
- Configurable tripping 0.02-0.5s
 - delay time (t): 0.2-5s

Reference standards

Compliant with standards: IEC/EN 60947-2.

General characteristics

- Earth leakage relay type A
- _ Configurable fail safe operation for RMT type only
- _ Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- _ Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Modular DIN 43880 housing, 2 module, with transparent cover, suitable for fixing on 35mm DIN rail (IEC/EN 60715)
- IEC degree of protection: IP20 terminals, IP40 on front with cover.

SETTINGS FOR RM1

- Selectable tripping set point ($I\Delta n$): fixed 0.3A or 0.5A
- Selectable tripping time (t): fixed 0.02s or 0.5s

ADJUSTMENTS FOR RM AND RMT

- Configurable tripping 0.025-0.25A 0.25-2.5A set-point (I∆n): 2.5-25A 25-250A (with external multiplier RX10 for RM only)
- 0.02-0.5s - Configurable tripping 0.2-5s
- delay time (t):

Reference standards

Compliant with standards: IEC/EN 60947-2.

For dimensions see page 9-20.

General characteristics

- Earth leakage relay type A
- Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Compact housing for fixing on panel mounting plate IEC degree of protection: IP20 terminals.

ADJUSTMENTS FOR RC

- Configurable tripping 0.025-0.25A 0.25-2.5A set-point $(I\Delta n)$:
- 2.5-25A - Configurable tripping 0.02-0.5s
 - delay time (t): 0.2-5s

Reference standards

Compliant with standards: IEC/EN 60947-2.

For dimensions see page 9-20.





Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	۲'	n°	[kg]
1 OPERATION THRESHOLD. Compact panel mount. CT incorporated.				-
31 RC@48	24-48VAC/DC	1	1	0.485

31 nu 🕑 40	24-40VAG/DG	1	1	0.405
31 RC@415	110-240-415V ①	1	1	0.485

A

- Supply voltage: 110-125VAC (50/60Hz)/DC 220-240VAC (50/60Hz)
- 280-415VAC (50/60Hz).
 280-415VAC (50/60Hz).
 280-415VAC (50/60Hz).
 280-415VAC (50/60Hz).









Qty Wt

per

pkg

[kg]

0.395

0.405

0.570

n°

1

1

1

Output

contacts

Earth leakage relays

Rated auxiliary

supply voltage

110-240-415V**0** 2

110-240-415V**0** 2

110-240-415V**0** 2

Fault current measurement. Digital display.

[V]

Flush mount. External CT. Fail safe

2 OPERATION THRESHOLDS.

2 OPERATION THRESHOLDS.

2 OPERATION THRESHOLDS.

Flush mount. External CT.

Fail safe. Flag indicator.

Supply voltage: 110-125VAC (50/60Hz) 220-240VAC (50/60Hz)

380-415VAC (50/60Hz)

For dimensions see page 9-20.

Flush mount. External CT.

Fail safe. Flag Indicator.

Ordering

R2D 415

R3D 415

R4D 415

code

Relays with 2 operation thresholds



R2D...



R3D...



R4D...

Toroidal cu	irrent
transforme	ers



Older code	Diameter	Орепаре	per pkg	VVI.
	[mm]		n°	[kg]
31 RT 35	35	No	1	0.200
31 RT 60	60	No	1	0.245
31 RT 80	80	No	1	0.410
31 RT 110	110	No	1	0.400
31 RT 210	210	No	1	1.200
31 RTA 110	110	Yes	1	0.540
31 RTA 210	210	Yes	1	1.820

Order code Diameter Openable Oty Wt

External multiplier

Order code	Description	Qty per pkg	Wt
		n°	[kg]
31 RX 10	10-fold multiplier suitable for R1D, RM, R2D, R3D and R4D types only	1	0.300

General characteristics

- Earth leakage relay type A
- 2 output relays each with changeover contact, configurable 2 tripping or 1 tripping and 1 alarm
- Configurable fail safe prealarm and operation Automatic toroid connection control
- Green power LED indicator (ON)
- _ Red relay tripped LED indicator (TRIP)
- _ Red tripping prealarm LED indicator (ALARM)
- Front TEST button
- Manual resetting by front RESET button or remote _ contact closing
- Automatic resetting by remote contact closing or rear jumper connection
- fumper connection Constant toroid-relay circuit control Flag indicator (TRIP MEMORY) (R3D-R4D only) Digital fault current measurement and display with configurable tripping value memory (R4D only) _ _
- Shunt tripping circuit operating test (TCS) (R4D only)
- _ Flush mount 96x96mm housing with transparent cover IEC degree of protection: IP20 terminals, IP40 on front
- _ with cover.

ADJUSTMENTS FOR R2D and R3D

Configuration

configurable tripping	0.025-0.25A
set-point (I∆n):	0.25-2.5A
,	2.5-25A
	25-250A (with externa
	multiplier RX10)
Prealarm set point	fixed 70%

- Prealarn
 Configure Configurable tripping 0.02-0.5s
- delay time (t): 0.2-5s

ADJUSTMENTS FOR R4D

- Configurable tripping 0.03-0.3A
 - set-point (I∆n): 0.3-3A 3-30A
 - 30-300A (with external
 - multiplier RX10)
- Prealarm set point fixed 70%
- Configurable tripping 0.03-0.5s delay time (t): 0.3-5s

Reference standards

Compliant with standards: IEC/EN 60947-2.

Reference standards Compliant with standards: IEC/EN 60947-2.

General characteristics

- Dimensions: refer to RT35 toroidal transformer on page 9-21.
- To connect between toroid and relay.

Reference standards

Compliant with standards: IEC/EN 60947-2.



67 (2.64")

43 (1.69")

Relays





67 (2.64")

RM1 - RM



RC



TYPE	A	В	С	D	E	F	G	Н
RC35	100 (3.94")	110 (4.33")	70 (2.75")	35 (1.38")	47 (1.85")	60 (2.36")	60 (2.36")	50 (1.97")
RC60	100 (3.94")	110 (4.33")	70 (2.75")	60 (2.36")	47 (1.85")	60 (2.36")	60 (2.36")	50 (1.97")
RC80	150 (5.90")	160 (6.30")	70 (2.75")	80 (3.15")	70 (2.75")	110 (4.33")	60 (2.36")	50 (1.97")
RC110	150 (5.90")	160 (6.30")	70 (2.75")	110 (4.33")	70 (2.75")	110 (4.33")	60 (2.36")	50 (1.97")





Earth leakage relays **Dimensions** [mm (in)]

Toroidal transformers and multiplier

RT35 - RT60 - RT80 - RT110 - RX10



-н-



RTA110



() With screws, for RTA210 split-core type; fixed structure, without screws, for RT210 type.

TYPE	A	В	С	D	E	F	G	Н	К
RT35	100 (3.94")	110 (4.33")	50 (1.97")	35 (1.38")	47 (1.85")	60 (2.36")	43 (1.69")	30 (1.18")	—
RT60	100 (3.94")	110 (4.33")	50 (1.97")	60 (2.36")	47 (1.85")	60 (2.36")	43 (1.69")	30 (1.18")	_
RT80	150 (5.90")	160 (6.30")	50 (1.97")	80 (3.15")	70 (2.75")	110 (4.33")	43 (1.69")	30 (1.18")	—
RT110	150 (5.90")	160 (6.30")	50 (1.97")	100 (3.94")	70 (2.75")	110 (4.33")	43 (1.69")	30 (1.18")	—
RT210	310 (12.20")	290 (11.41")	54 (2.12")	210 (8.27")	145 (5.71")	240 (9.45")	280 (11.02")	36 (1.42")	258 (10.16")
RTA110	180 (7.09")	150 (5.90")	45 (1.77")	110 (4.33")	75 (2.95")	110 (4.33")	38 (1.50")	25 (0.98")	145 (5.71")
RTA210	310 (12.20")	290 (11.41")	54 (2.12")	210 (8.27")	145 (5.71")	240 (9.45")	280 (11.02")	36 (1.42")	258 (10.16")
BX10	100 (3.94")	110 (4.33")	50 (1.97")	_	_	60 (2 36")	43 (1 69")	30 (1 18")	_

